

SAFETY DATA SHEET

Fluorite (acid, metallurgical, or ceramic grade)

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Version: 7

In accordance with Article 31.3 of Regulation 1907/2006/EC, the product, being a substance not classified according to Regulation 1272/2008/EC but presenting a community workplace exposure limit, requires an SDS upon request.

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name: Fluorite (acid, metallurgical, or ceramic grade)

REACH registration number: Substance included in Annex V of Regulation (EC) 1907/2006 exempt from the registration obligation pursuant to Article 2 paragraph 7 of the same.

EC name: Fluorite (CaF₂)

Product description: Odorless crystalline solid, color ranging from orange to reddish-brown

- Metallurgical grade approximately 0.6 – 60 mm;
- Acid and ceramic grade approximately 0.05 – 0.3 mm

Other names: Calcium Fluoride or difluoride, fluoride, fluorospar, fluorite, natural fluorite

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: smelting in steelmaking, glass production, and hydrofluoric acid production

1.3 Details of the supplier of the safety data sheet

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1.4 Emergency telephone number

- CAVp “Osp. Pediatrico Bambino Gesù” – Rome – Tel. 06 68593726
- Az. Osp. Univ. Foggia – Foggia – Tel. 800183459
- Az. Osp. “A. Cardarelli” – Naples – Tel. 081 5453333
- CAV Policlinico “Umberto I” – Rome – Tel. 06 49978000
- CAV Policlinico “A. Gemelli” – Rome – Tel. 06 3054343
- Az. Osp. “Careggi” U.O. Medical Toxicology – Florence – Tel. 055 7947819

- CAV National Center for Toxicology Information – Pavia – Tel. 0382 24444
- Osp. Niguarda Ca' Granda – Milan – Tel. 02 66101029
- Azienda Ospedaliera Papa Giovanni XXII – Bergamo – Tel. 800883300
- Azienda Ospedaliera Integrata Verona – Verona – Tel. 800011858

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

The product is not classified as hazardous according to the provisions of Regulation (EC) 1272/2008 (CLP) (and subsequent amendments and adaptations).

2.2 Label elements

Hazard pictogram: none

Warning: none

Hazard statements: none

Precautionary statements: not applicable

2.3 Other hazards

Based on available data, the product does not contain PBT or vPvB substances or substances with endocrine-disrupting properties at levels higher than 0.1%.

Other hazards not mentioned in the classification:

Handling and/or use of this material may generate dust that can irritate the respiratory tract and eyes. Repeated inhalation exposure at levels well above the occupational limit can cause adverse effects on the bones (fluorosis), even with repeated ingestion of small amounts. Absorption of fluoride can cause metabolic imbalances with irregular heartbeat, nausea, dizziness, vomiting, and seizures.

Depending on the type of use, respirable crystalline silica may be generated in the air. Prolonged and massive inhalation of respirable crystalline silica dust can cause lung fibrosis, commonly known as silicosis. The main symptoms of silicosis are cough and difficulty in breathing. Occupational exposure to respirable crystalline silica dust must be monitored and controlled.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Product name: Calcium Fluoride (naturally occurring substance)

CAS number: 14542-23-5

EC number: 238-575-7

Concentration: 80 – 98%

This product contains quartz (CAS 14808-60-7, EC 238-878-4) in a concentration of 0.9-7.5%, with less than 1% respirable fine fraction classified as STOT RE 1 (H372).

No additional ingredients are present, which, to the supplier's current knowledge and in the applicable concentrations, are classified as harmful to health or the environment and therefore must be reported in this section.

The complete texts of the classifications and hazard statements are reported in section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Eye contact: Immediately rinse with water, lifting eyelids, for at least 10 minutes and seek medical advice.

Skin contact: Remove contaminated clothing and wash the skin with soap and water.

Inhalation: Remove the patient from the exposure source, ensuring they are warm and at rest. If symptoms persist, consult a doctor.

Ingestion: Do not induce vomiting. Rinse the mouth with water and give 200-300 ml of water to drink. If symptoms continue, consult a doctor.

4.2 Most important symptoms and effects, both acute and delayed

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly studied.

4.3 Indication of any immediate medical attention and special treatment needed

Notes for the physician: Treat symptomatically. In case of large quantities ingested or inhaled, contact a poison center immediately.

Specific treatments: No specific treatment.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

The product is not flammable.

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: Do not use a water jet as an extinguishing agent, as it may spread the fire.

5.2 Specific hazards arising from the substance or mixture

Hazardous combustion products: The decomposition products may include the following materials:

- Carbon dioxide
- Carbon monoxide
- Hydrofluoric acid

Calcium fluoride decomposes at 1,500°C, releasing fluorine gas.

5.3 Advice for firefighters

Special precautions for firefighters: Move containers away from the fire area if there is no risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for firefighters: Firefighters should wear protective equipment and a self-contained breathing apparatus (SCBA) with a full-face shield operating in positive pressure mode. Firefighting clothing (including helmets, protective boots, and gloves) conforming to European standard EN 469 will provide basic chemical incident protection.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel: Wear appropriate personal protective equipment, including a dust protective mask, during spill cleanup operations.

6.2 Environmental precautions

Avoid dispersing spilled material and contact with soil, waterways, and drains.

6.3 Methods and materials for containment and cleaning up

Remove containers from the spill area. Vacuum or sweep up the material and place it in a labeled waste container. Use spark-proof tools and explosion-proof equipment. Dispose of via an authorized waste disposal company.

6.4 References to other sections

For further information, see Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures: Avoid contact with eyes and prolonged skin contact. Ensure adequate ventilation, including local exhaust, to keep exposure below the occupational exposure limit.

General occupational hygiene: Eating, drinking, and smoking are prohibited in areas where the material is handled, stored, or processed. Workers should wash hands and face before eating, drinking, and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Keep away from incompatible materials such as strong acids.

7.3 Specific end uses

Production of hydrogen fluoride; glass production; fluxing agent in steelmaking.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

- **Calcium fluoride:** OEL (EU) = 2.5 mg/m³ (inorganic fluorides, expressed as F) for 8 hours. Exposure limit adopted in Italy.
- **Respirable crystalline silica dust:** OEL (EU) = 0.1 mg/m³ (respirable fraction, 8h)
VLEP (IT) = 0.1 mg/m³ (respirable fraction, 8h)

8.2 Exposure controls

Technical controls: It is advisable to implement good general ventilation (typically 10 air changes per hour). Ventilation rates should match operational conditions. Where applicable, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne dust levels below recommended exposure limits. If no exposure limits are set, keep dust levels in the air to an acceptable level.

Hygiene measures: Ensure that an eyewash station and safety showers are close to the workplace. Wash hands, arms, and face thoroughly after handling chemicals before eating, smoking, using the restroom, and at the end of the work period.

Eye and face protection: It is recommended to wear a face shield and side-protective goggles compliant with UNI EN 166 when handling the product.

Hand protection: Wear gloves suitable for the work or task being performed.

Skin protection: Personal protective equipment for the body should be chosen based on the hazards anticipated for the task being performed.

Respiratory protection: If exposure concentrations exceed exposure limits, use appropriate respiratory protection based on the known or anticipated exposure levels and compliant with relevant EN standards (filtering facepiece certified according to UNI EN 149 or dust mask certified according to UNI EN 140).

Exposure controls: Emissions from ventilation or work process equipment should be checked to ensure compliance with environmental protection legislation.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- Physical state:** Solid
- Color:** From white to pale reddish-brown
- Odor:** Odorless
- Melting point/freezing point:** 1420°C
- Boiling point or initial boiling point and boiling range:** 2500°C
- Flammability:** Non-flammable
- Lower and upper explosion limit:** Not applicable, solid
- Flash point:** Not applicable, solid
- Auto-ignition temperature:** Not applicable, solid
- Decomposition temperature:** Not applicable for substances with a melting point > 300°C
- pH:** 7 - 8 (aqueous semi-liquid)
- Kinematic viscosity:** Not applicable, solid
- Solubility:** Insoluble in water
- Partition coefficient n-octanol/water (log value):** Not required for inorganic substances

- o) **Vapor pressure:** Not applicable, solid with melting point > 300°C
p) **Density and/or relative density:** 3.18
q) **Relative vapor density:** Not applicable, inorganic solid
r) **Particle characteristics:** Crystalline powder

- Metallurgical grade approximately 0.6 – 60 mm
- Acid and ceramic grade approximately 0.05 – 0.3 mm

9.2 Other information

No additional information available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity No specific experimental reactivity data are available for this product or its ingredients. Exposure to strong acids may produce hydrofluoric acid (corrosive and toxic).

10.2 Chemical stability The product is stable under normal conditions of use and storage.

10.3 Possibility of hazardous reactions Possibility of hydrofluoric acid gas release at temperatures above 1000°C in the presence of moisture in the air. If exposed to strong acids, it may release hydrofluoric acid (corrosive and toxic).

10.4 Conditions to avoid Avoid temperatures above 1000°C. Contact with concentrated sulfuric acid at high temperatures can produce hydrofluoric acid.

10.5 Incompatible materials Strong acids, oxidizing agents, water.

10.6 Hazardous decomposition products Reacts with acids. If exposed to strong acids, it may release corrosive and toxic hydrofluoric acid.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

No specific data available on the product.

Acute toxicity

- **LC50 (Inhalation - vapors):** Not classified
- **LC50 (Inhalation - mist/dust):** Not classified
- **LD50 (Oral):** Not classified (LD50 (Oral) Calcium fluoride = 4250 mg/kg (rat))
- **LD50 (Dermal):** Not classified

Skin corrosion/irritation Does not meet the criteria for classification for this hazard class. Repeated or prolonged contact may cause dryness of the skin and therefore slight irritation.

Serious eye damage/eye irritation Does not meet the criteria for classification for this hazard class.

Respiratory or skin sensitization Does not meet the criteria for classification for this hazard class.

Germ cell mutagenicity Does not meet the criteria for classification for this hazard class.

Carcinogenicity Does not meet the criteria for classification for this hazard class.

Reproductive toxicity Does not meet the criteria for classification for this hazard class.

Specific target organ toxicity (STOT) — single exposure Does not meet the criteria for classification for this hazard class.

Specific target organ toxicity (STOT) — repeated exposure Does not meet the criteria for classification for this hazard class. Prolonged inhalation exposure at levels well above occupational limits may cause adverse effects on bones (fluorosis) following repeated ingestion of small amounts. Crystalline silica may cause silicosis or other lung problems following prolonged exposure.

Aspiration hazard Does not meet the criteria for classification for this hazard class.

11.2 Information on other hazards Based on available data, the product does not contain any substances with endocrine-disrupting properties in a concentration of 0.1% or higher.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity LC50 fish 125 mg/l (48h, Brown trout (*Salmo trutta*), calcium fluoride)

12.2 Persistence and degradability No data available on the degradability of the product.

12.3 Bioaccumulative potential Has potential for bioaccumulation.

12.4 Mobility in soil The material is essentially insoluble in water, thus can be separated from aqueous medium through sedimentation and filtration at a wastewater treatment plant.

12.5 Results of PBT and vPvB assessment Based on available data, the product does not contain any PBT or vPvB substances in a concentration of 0.1% or higher.

12.6 Endocrine disrupting properties Based on available data, the product does not contain any substances with endocrine-disrupting properties in a concentration of 0.1% or higher.

12.7 Other adverse effects No known significant effects or critical hazards.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods Waste generation should be avoided or minimized wherever possible. Significant quantities of product residues should not be disposed of via the sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions, and any by-products should always comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. Do not dispose of product and container except through proper channels. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.

SECTION 14: TRANSPORT INFORMATION

The product does not fall under any hazard class for the transport of dangerous goods and is therefore not subject to related modal regulations: IMDG (sea), ADR (road), RID (rail), ICAO/IATA (air).

Fluorite tends to liquefy during sea transport in large quantities. It is also subject to fluorine release if heated to the point of decomposition or hydrofluoric acid if it comes into contact with strong acids. Therefore, under the IMSBC (International Maritime Solid Bulk Cargoes) code, the substance is classified as Group A Group B cargo and requires the application of appropriate procedures.

14.1 UN number or ID number Not applicable.

14.2 UN proper shipping name Not applicable.

14.3 Transport hazard classes Not applicable.

14.4 Packing group Not applicable.

14.5 Environmental hazards Not applicable.

14.6 Special precautions for user Not applicable.

14.7 Maritime transport in bulk according to IMO instruments Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health, and environmental regulations/legislation specific for the substance or mixture

Fluorite is a naturally occurring substance and therefore exempt from REACH Regulation.

- **Annex XVII - Restrictions on the manufacture, placing on the market, and use of certain dangerous substances, mixtures, and articles:** Not applicable.
- **Other EU regulations:** Not applicable.
- **European Inventory:** All components are listed or exempt.
- **Black list chemicals:** Not listed.
- **Chemical Weapons Convention:** Present.
- **IPPC List (Integrated Pollution Prevention and Control) – Air:** Present.
- **IPPC List (Integrated Pollution Prevention and Control) – Water:** Not listed.

15.2 Chemical safety assessment As the substance is exempt from registration under Article 2, paragraph 7 of Regulation (EC) 1907/2006, it is not subject to the obligation of chemical safety assessment.

SECTION 16: OTHER INFORMATION

This Safety Data Sheet has been prepared in accordance with Regulations 1907/2006/EC and 1272/2008/EC. Revised throughout to comply with Regulation 878/2020/EU.

Main bibliographic sources:

- Regulation (EC) No 1907/2006 of the European Parliament (REACH) and subsequent adjustments
- Regulation (EC) No 1272/2008 of the European Parliament (CLP) and subsequent ATPs
- **Occupational exposure limits to chemical agents at the workplace:**
 - Italy: Legislative Decree 9 April 2008, n.81.
 - EU OEL: Directives 2019/1831/EU; 2019/983/EU; 2019/130/EU; 2017/2398/EU; 2017/164/EU; 2009/161/EU; 2006/15/EC; 2004/37/EC; 2000/39/EC.

Other sources:

IARC and SCOEL publications

In 1997, the International Agency for Research on Cancer (IARC) declared that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However, it emphasized that not all industrial circumstances, nor all types of crystalline silica, should be incriminated. (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicates dust, and organic fibers, 1997, Vol. 68, IARC, Lyon, France)

In June 2003, the EU Scientific Committee for Occupational Exposure Limits (SCOEL) stated: "the main effect on humans of the inhalation of respirable crystalline silica dust is silicosis. There is sufficient information to conclude that the relative risk of lung cancer is increased in individuals with silicosis (and, as far as is known, not in employees without silicosis exposed to silica dust in quarries and the ceramics industry). Therefore, preventing the onset of silicosis will also reduce the risk of cancer. It is thus impossible to clearly identify a threshold for the development of silicosis: consequently, any reduction in exposure will reduce risk." (SCOEL SUM Doc 94-final on respirable crystalline silica, June 2003)

There is evidence supporting that the greater risk of cancer is limited to individuals already suffering from silicosis. Protecting workers from silicosis should be ensured by adhering to the occupational exposure limits established by existing regulations and implementing additional risk management measures where necessary.

Social Dialogue on Respirable Crystalline Silica

On April 25, 2006, a multi-sectoral social dialogue agreement titled "Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it" was signed. This autonomous agreement, which received financial support from the European Commission, is based on a Good Practice Guide. The provisions of the agreement came into effect on October 25, 2006. The agreement was published in the Official Journal of the European Union (2006/C 279/02). The text of the agreement and its annexes, including the Good Practice Guide, are available at <http://www.nepsi.eu> and offer useful information and guidelines for handling products containing respirable crystalline silica.

Abbreviations and Acronyms:

- **ATE** = Acute Toxicity Estimate
- **CLP** = Classification, Labelling and Packaging [Regulation EC No 1272/2008]
- **DNEL** = Derived No-Effect Level
- **EUH Indication** = Specific hazard statements under the CLP regulation
- **PNEC** = Predicted No-Effect Concentration
- **RRN** = REACH Registration Number

Full Texts of Hazard Statements and Classifications

- **STOT RE 1:** Specific target organ toxicity — repeated exposure (Category 1)
- **H372:** Causes damage to organs through prolonged or repeated exposure. Inhalation (Lungs)

Classification and Procedure Used to Derive It According to Regulation 1272/2008/EC

- **Classification according to Regulation 1272/2008/EC**
- **Classification Procedure**
 - Specific target organ toxicity, repeated exposure (Category 1)
 - Calculation method* *The calculation method has been applied cautiously given the variability of the natural product.

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